

EIRSAT- 1 THERMAL ANALYSIS

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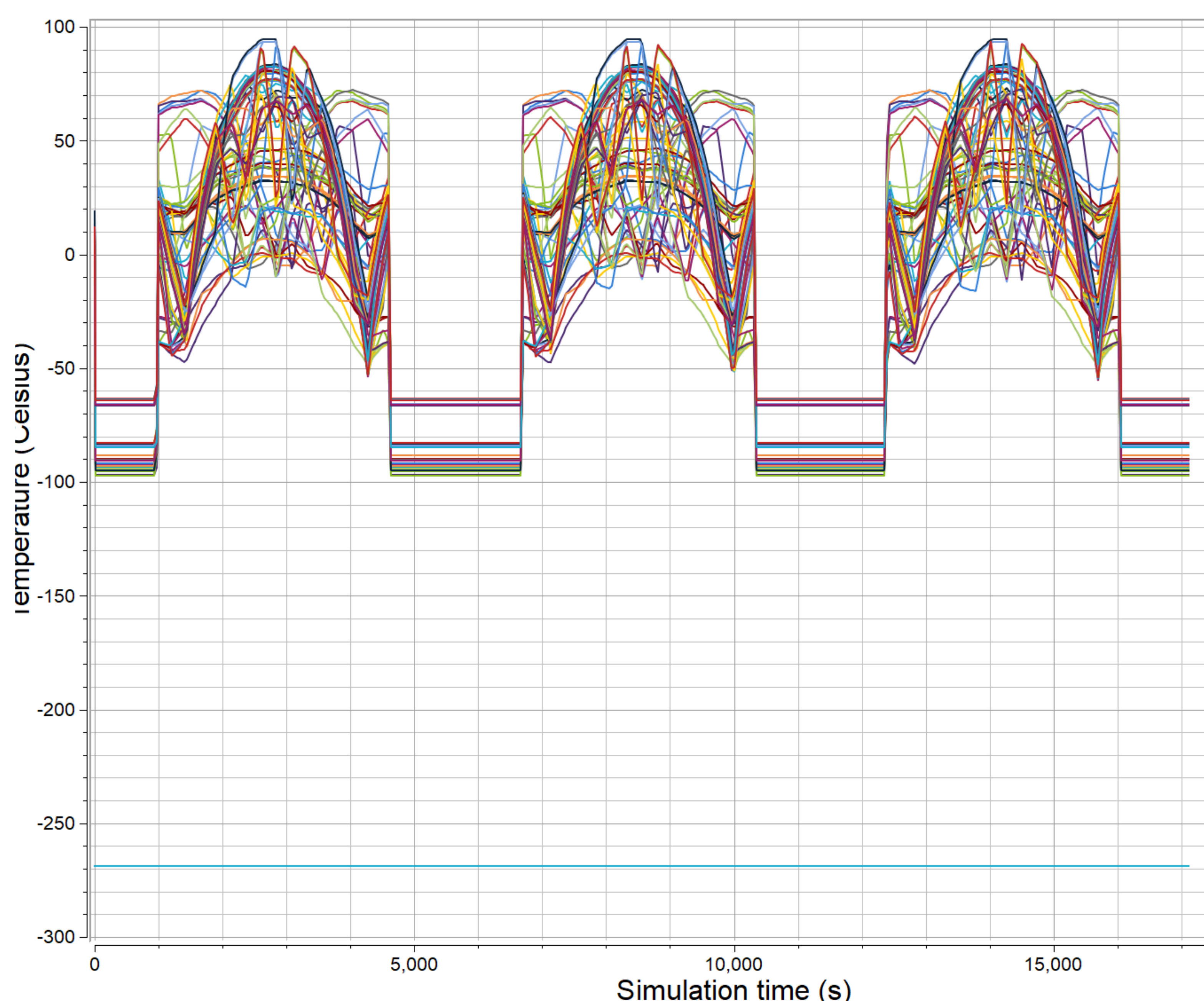


EIRSAT-1

"EIRSAT-1 is the Educational Irish Research Satellite 1. It is a 2U CubeSat being developed as part of the European Space Agency's Fly Your Satellite programme." My work this semester uses Thermica software to model the satellite, simulate its orbit, and analyze the temperature fluctuation. . Thermal analysis is crucial to ensure the components onboard stay within the functioning temperature range.

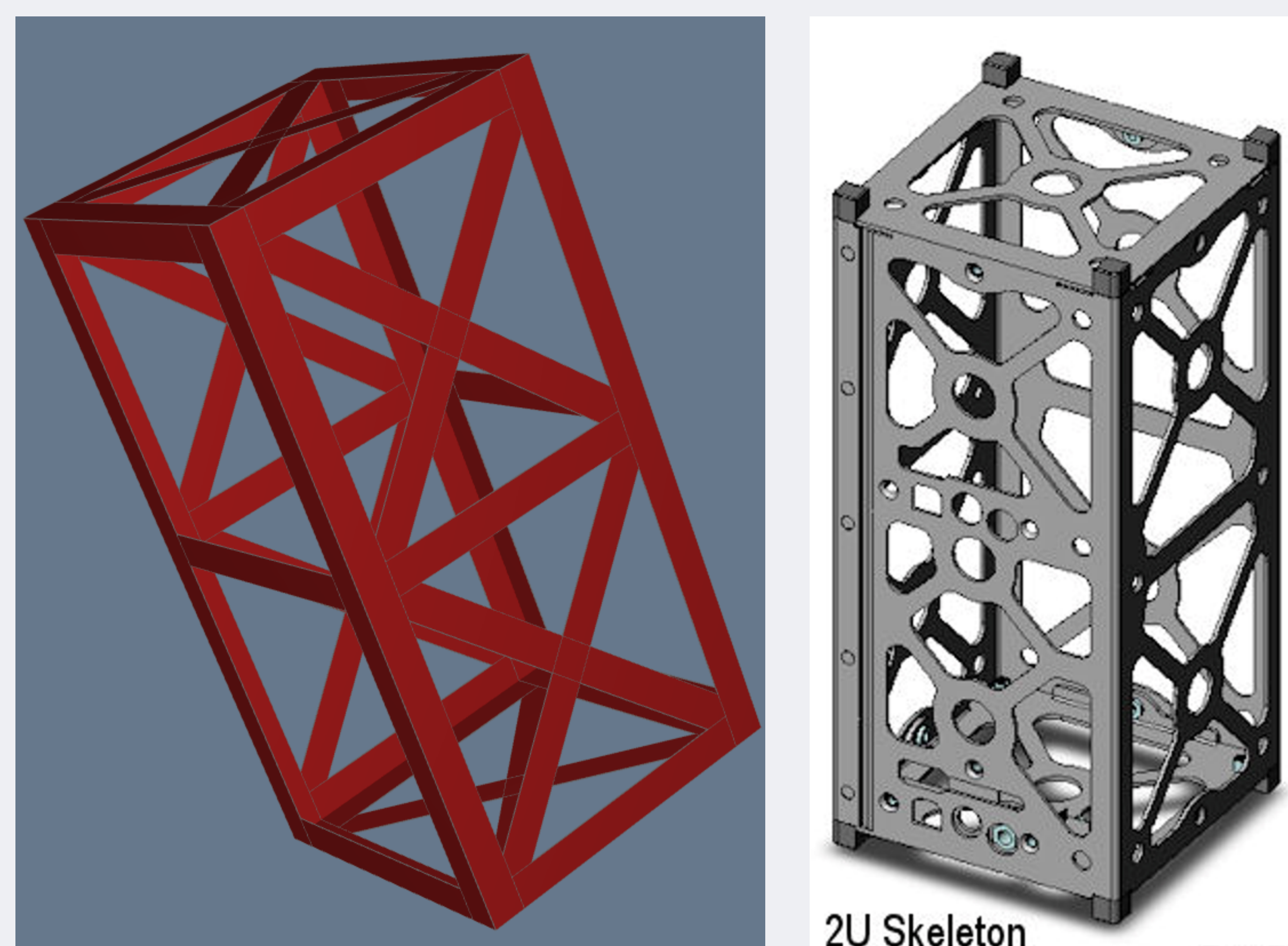
RESULTS

The graph below demonstrates the temperature at different points on the satellite during orbit. According to this graph, the temperature on some nodes is rising up to 95 degrees Celsius. The target range is below 50 degrees Celsius so this shows that something is wrong with the current simulation. There are many reasons for this that I am addressing as I continue to modify the simulation



METHOD

MODELING



In order for the software to efficiently and accurately simulate the orbit of the satellite, I created a simplified model based on the skeleton model of EIRSAT-1. This model is simple enough that the simulation can run, but complex enough that it can accurately represent the satellite for thermal analysis.

SIMULATING

The kinematics and trajectory files set the orbit and orientation of the satellite. Eirsat-1 is set to follow a sun synchronous orbit at 520km with the longitude of the descending node (LDTN) set for 10:30. The satellite is also going to be rotating such it is always at 45 degrees to the sun.